Sustainable Rural Development under Agenda 2030

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Chapter 2

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Florin-Constantin Mihai and Corneliu Iatu

1. Introduction

The rural environment is a complex system in which the differences in development are evident both at the subnational and international level. The difficulties related to methodological analysis are due to such rural diversity and the partial lack of comparable indicators which lead to the development of objectives and indicators that respond to both national and international needs. Harmonization should be easier in view of the common goal, but policies and strategies do not always provide the required coherence.

The presence of programmatic documents such as the Agenda 2030 reveals a path that can lead to good practices and reliable results even if they do not offer universal or global certainties. Politics at various levels play a decisive role and not always these take the best decisions regarding the rural environment. Thus, there is a diversity of situations, and the application of models is not necessarily a solution because of a wide spectrum of particular conditions at regional and local levels that must be taken into account. However, some mechanisms must be further developed to comply the international sustainable development perspectives to regional and local scales including rural areas.

Agenda 2030 relies on 17 sustainable development goals and 169 targets supported by the United Nations as a global effort to manage current challenges related to poverty, climate, environmental pollution, geographical inequalities, prosperity, peace, and justice [1]. This key strategic document continues the previous Eight Millennium Development Goals (started in 2000) committed to combat poverty, hunger, disease, and illiteracy, to promote gender equality and to ensure environmental sustainability until 2015 [2].

The Paris Agreement aims to undertake ambitious efforts to combat climate change and adapt to its effects among developed and developing countries and to build future clean and climate-resilient communities [3]. The Paris Agreement and the Agenda 2030 are the most ambitious international initiatives so far which address major concerns related to future economic development perspectives combined with societal and environmental sustainability issues. Such actions must take into consideration the huge rural-urban gaps in terms of socioeconomic conditions and reveal the exposure of rural areas to current societal and environmental threats. Despite the rural-urban migration process, rural areas comprise vast geographical regions where a significant population still lives and faces emerging threats associated with climate change, poverty, and lack of critical infrastructure, particularly across developing and transition countries. Reducing geographical and socioeconomic inequalities in terms of basic needs must be a priority at international level. On the other hand, rural lands feed all basic needs of urban areas' (raw materials, energy sources, food supply, water, etc.) additional labor force while preserving the natural habitats of endemic species (flora and fauna) and

landscapes (e.g., protected areas). Rural settlements also contribute to the cultural and patrimonial heritage of each region and country. Therefore, sustainable rural development is a complex issue (environment-economic-social nexus) which must be further addressed with the same attention by academics, international bodies, national and local authorities, professionals, and members of civil society as for urban areas.

2. Societal and environmental threats in rural areas

Rural communities are facing several challenges in the context of climate change, land degradation, deforestation, biodiversity loss, and fragmentation of natural habitats, poverty, and geographical isolation. The rural population is more prone to extreme poverty, famine, social exclusion, and environmental injustice, particularly in developing countries from Africa, Asia, and Latin America. Rural communities depend on local geographical conditions (climate, natural resources, landscape, and geographical barriers, socioeconomic conditions, demographic features) to develop agricultural, industrial, or tourism activities as economic development pathways. A traditional economy based on subsistence agriculture is still widespread across rural regions of the globe. This type of economy is volatile to natural hazards (extreme weather, flash floods, landslides, erosion, drought) and poor agricultural productivity which translates into famine, extreme poverty, land abandonment, and massive migration. Land use management is a key factor for future rural development perspectives and to find the optimal equilibrium between natural habitats, agricultural lands, and built-up areas. **Figure 1** reveals the emerging societal and environmental threats, sectoral approaches, and synergic effects that must be addressed at subnational levels by each country via regional and local authorities towards rural areas.

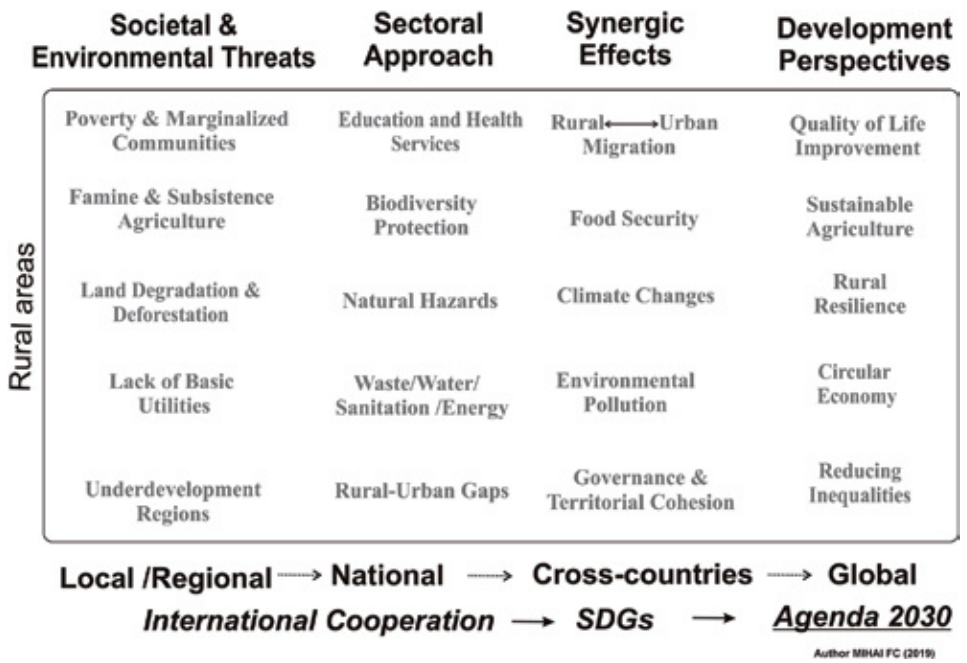

Figure 1.
Challenges of rural communities under agenda 2030 framework.

Rural areas must cope with social, demographic, economic, governance, and environmental challenges. As an example, extensive cattle ranches and emerging oil palm cultivation threaten biodiversity conservation and food security across tropical rural regions while increasing social inequalities and conflicts [4]. On the other hand, agricultural land abandonment (associated with traditional farming, low productivity, poor infrastructure, aging population, massive migration, land ownership change, political instability) has created several socioeconomic and ecological dysfunctionalities in southeastern Europe [5].

Poor agricultural productivity in the Global South is related to the low use of improved seed, use of inappropriate fertilizer, inadequate irrigation, and lack of incentives for farmers in the absence of remunerative markets [6]. Extreme poverty, hunger, and undernourishment and rural depopulation are critical issues to be solved across rural Africa besides the poor access to critical amenities (health/education services, sanitation, and water facilities, energy) [7]. Climate changes, land fragmentation, natural resource depletion, political instability, corruption, and conflict areas will further threaten rural areas of developing countries.

In this context, rural resilience and circular economy are key strategic directions to further develop rural economies and reduce socioeconomic inequalities and environmental injustice coupled with access to proper education. A linear economy based on "take-make-dispose" model feed by consumerism society is harmful for the environment and long-term sustainability of urban and rural areas. The EU is aware of the importance of shifting economic model from linear to an ambitious circular economy framework (https://ec.europa.eu/environment/circular-economy/index_en.htm) based on the 3Rs principles such as "reduce-reuse-recycle."

There are other activities which could be integrated resulting 6Rs policy such as the revaluation (of resources), redistribution (of income) and (improve) relations or 9Rs with another three Rs added such as resilience (adaptability), reassessment (scale value) and restructuring (of the economy) (source: https://www.activesustainability.com/sustainable-life/learnsustainability-the-3rs-6rs-and-9rs/).

This new policy needs to be adopted by each EU country including rural areas of Eastern Europe. In countries like Romania, with over 2800 rural municipalities (communes) and other villages included in urban administrative areas, this transition from linear to circular economy could lead to new rural business opportunities based on responsible production and consumption of natural resources (organic farming, agritourism, local niche products, upcycling or creative reuse, etc.) while promoting local traditions and preserving the rural and natural landscapes. International cooperation is needed to successfully achieve the ambitious SDGs until 2030 at the global level. The development perspectives show some critical objectives which cannot be achieved without improvement of rural conditions across each continent.

3. Rural population access to basic public utilities

Poverty and poor infrastructure are the main drivers for underdevelopment and environmental degradation. Rural settlements must have access to basic public utilities to ensure a decent quality of life in areas without significant geographical restrictions.

At the global level, there are huge rural-urban gaps regarding population access to critical amenities such as drinking water, sanitation, electricity, and waste management services, particularly in low- and middle-income countries. Rapid urbanization in developing countries feeds rural-urban migration where poor people have crowed in slum areas without access to urban main public services

threatening public health and local environment. Uncontrolled urban expansion towards surrounding rural lands leads to such informal settlements. There are 1.9 billion rural people without access to formal waste management services, and the coverage rate is under 50 among 105 countries [8]. This critical situation translates into million tons of household waste generated and uncollected each year, which leaks into the natural environment via wild dumps, waste dumping in water bodies, or open burning practices. Freshwater ecosystems are often affected by the uncontrolled disposal of waste which further contaminates the downstream water bodies through heavy rains and floods and finally reaches the marine environment. Wildlife is heavily exposed to plastic pollution where rural communities can contribute directly through fishing activities or indirectly as land-based sources via unsound waste management activities.

A study breaks down the rural infrastructure in China in three major categories: facilities for living and production (e.g., drinking water, irrigation, electricity, roads, wastewater treatment, and waste management), development infrastructure (education and healthcare), and environmental infrastructure (clean energy, green housing, and the environmental protection system) [9].

However, **Figure 2** reveals a complex structure of public utilities as essential services for each rural municipality in the world. The lack or poor coverage of public utilities across rural regions leads to environmental degradation via air-water-soil nexus. These are essential services to maintain a decent standard of public health and to protect the natural environment against daily disturbances induced by human needs and economic activities.

The public utilities involve a multi-sectoral approach and a systemic perspective in adopting best current practices which will provide an easier transition to a diverse range of SDGs as shown in **Figure 2**. Thus, the improvement of such public services via sanitation facilities, water, and waste management, clean energy, road networks, and digital technologies will provide the base to build a sustainable development community.

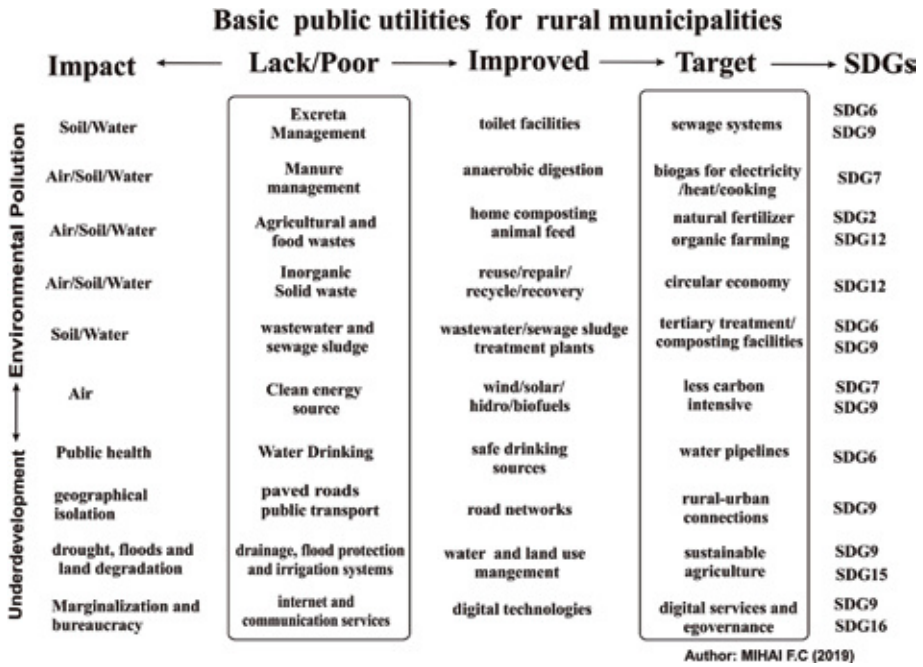

Figure 2.
Public utilities as critical infrastructure for sustainable rural development.

In nowadays, rural areas are still neglected by public services as in the case of former Soviet countries [10]. Furthermore, Central Asia is facing a growing urban-rural divide as a result of a capital city-centric growth model, economic nationalism, and water resource conflicts [11]. Additionally, rural depopulation of Russia makes more difficult to revitalize such regions, despite some recent efforts to improve population access to basic utilities [12]. Poor socioeconomic conditions in rural areas of new EU members stimulate the external migration (abroad) towards older EU countries, as in the case of Romania which facing is labor shortage. Distant rural settlements from urban areas are now facing such labor shortages combined with the aging population process. These peripheral regions lack critical amenities and have poor opportunities for economic development which still depend on traditional farming. Public investments in infrastructure and public utilities are crucial to reconnect such pockets of poverty areas to cities and emerging markets and, on the other hand, to mitigate the rural migration phenomenon.

Improvement of rural mobility by public transport network is essential for access to education (high schools, universities), healthcare services, justice, and social programs.

In developed countries, there is a counter-urbanization process in the proximity of larger cities by movement of people to surrounding rural areas, avoiding noise and air pollution of core cities. There is an intense rural land reclamation for housing, transport, commercial, or industrial infrastructures around "peri-urban" areas including tourism and recreational activities. Therefore, the monopoly of farming activities is replaced by manufacturing, industrial, and various services close to larger urban areas where metropolitan regions emerge. However, this situation is in contrast with distant rural communities with primary focus in exploitation of natural resources and farming activities.

Despite the economic development in the latter years, China must manage several environmental challenges in rural areas such as [9] increasing waste generation rate with insufficient treatment capacity, crude and backward wastewater facilities, regional disparities in terms of sanitation services, and safe drinking-water sources' issues. Similar challenges are facing Indonesia, where rural areas are poorly endowed with infrastructures like roads, sanitation, clean water, and energy [13]:

Biogas is a perfect solution for decentralized off-grid electricity situations in rural areas where an abundance of biowaste is available as feedstock; therefore, biogas could be used for cooking, heating, or gas lighting [14]. Anaerobic digestion is a proper solution to divert organic waste leaking into the natural environment towards an energy source (biogas) of fertilizer (digestate) for agricultural land. Animal feed and home composting practices are additional options to handle the organic waste produced at household level supporting organic farming and animal husbandry. Source separated of dry recyclables (metals, plastics, paper/cardboard, wood) would stimulate recycling and recovery practices via local small- and medium-sized enterprises (SMEs) enacting the first steps towards a rural recycling society.

Rural communities must evaluate the exposure of its territory to natural hazards (floods, heavy rains, heatwaves, hail occurrence, drought, desertification, wildfire) and to take necessary measures to combat such threats. Poor population and peripheral rural areas are most vulnerable to climate change effects due to their reliance on subsistence agriculture.

Rural population access to mobile phones and the Internet could improve agricultural productivity and better land use management practices based on updated knowledge. Also, digital technologies will help rural councils to reduce bureaucracy and increase transparency in community decisions. Better virtual connectivity to high-speed Internet services will provide new collaborative opportunities for rural entrepreneurs including women empowerment.

4. Pathways towards sustainable development goals (SDGs)

The EU Cohesion Policy and Common Agricultural Policy (CAP) are two strategic initiatives which can help to reduce the geographical inequalities in Central and Eastern Europe in terms of basic infrastructure, promoting economic activity and agricultural development and improving the qualifications and skills of the inhabitants, particularly in rural areas [15]. However, the impact of such policies in case of new EU member states needs to be further adjusted with proper funding to boost local and regional economies. The gradual decline of fishery activities across EU rural coastal areas makes it difficult to revitalize these regions, despite new policy incentives such as the Common Fisheries Policy (CFP) as shown in case of Greece [16].

The EU policies and financial instruments must accelerate the mitigation gap between western high-income countries and former Soviet countries of the Eastern Bloc where rural regions are regularly left behind. New projects like LiveRur (https://liverur.eu/) identify the innovative business models that are currently being developed in rural areas based on the sustainable mobilization of resources and better cooperation between operators along the value chain and lead to new services. At regional level, collective forest management supported by small-scale business projects could maintain the network of local produce markets with attractive esthetic values as well as biodiversity conservation [17].

The role of small- and medium-sized enterprises in rural areas is based on local resource use, contributions to the local public budget, job creation, development of infrastructure, and engagement with community [18]. Furthermore, small-scale farmers using agroecological practices can produce the food necessary for diversified, nutritious, sustainable diets, while protecting environmental resources from further degradation [19]. Long-term growth policies should be reoriented to favor small farmers instead of big agribusiness players to maintain food security and social equity in tropical regions [4]. New urban-rural relations, in terms of organic food production, stimulate nearby farmers to adopt the best management practices and to develop nonfarming activities (e.g., tourism and recreational activities, environmental conservation, forest restoration) or urban-rural migration [20].

Rural households that wish to market their products are restricted to local markets, or their production is sold at low prices to intermediaries [12]. This situation is specific to other Eastern European countries where the dispersion of villages, poor road networks, and the urban concentration of services are impediments in the development of direct linkages between local rural producers and urban customers. The development of farmer associations could be a solution in increasing access to regional or even national markets, to provide short supply chains and to reduce reliance on food product imports from abroad, particularly in countries with high potential in agricultural productivity like Romania. Such countries need to raise their rural economies from cheap raw material providers dedicated to exports towards manufactured products and services (e.g., furniture industry, food industry, organic farming, renewable energy, agritourism).

Digital technologies provide new ways to access price and market information, to coordinate input/output resources (including transport and logistics, finance, and production techniques) which could help the agriculture sector in the Global South as shown in several case studies [6].

Improvement of water harvesting, cultivating drought-resistant crops, ecological restoration, combined with better local governance, financial instruments, integrated resource management, sound public services, and better urban-rural linkages could help rural communities around the world to become more sustainable.

Remote rural areas of developing countries should rely on renewable energy sources due to poor coverage of electric grids, high costs of fuel transportation, unsuitable roads, and increasing consumption of biomass fuels with related pollution issues [21].

In this context, "Smart Village" is a promising initiative to provide energy access to remote villages as a catalyst development route for other related sectors such as clean water, sanitation, education, healthcare, and gender equity and support the local markets and democratic engagement as stipulated by SDGs [22].

In poor rural areas of developing countries like Bangladesh, where energy source is based on wood or dried cattle dung, the bioenergy systems (e.g., anaerobic digestion of biowaste) at household level could be a solution in achieving several SDGs [3–5, 7] with societal and environmental benefits despite of major challenges in implementing such projects at large scale associated with severe poverty, poor education, lack of awareness, social and cultural barriers, etc. [23]. Training activities and environmental awareness should combat such barriers, and fortunately, domestic biogas activities start to emerge in developing and transition countries across the globe such as Pakistan, India, China, Vietnam, Laos, Cambodia, Vietnam, Indonesia (Asia); Morocco, Algeria, Cote D'Ivoire, Burkina Faso, Eritrea, Ethiopia, Kenya, Tanzania, Burundi, Rwanda, Uganda (Africa), Colombia, Peru, and Bolivia (South America) [14].

Rural tourism, agritourism, religious tourism, and ecotourism are alternatives or complementary economic activities that could further stimulate rural entrepreneurship while decreasing rural community dependency on one main economic sector (agriculture, forestry, energy, mining, or fishing activities).

Rural communities must respond to wide range of shocks (such as natural events, policy changes, economic disturbances, and insecurity), and successfully managing such risks increases the resilience of a rural community [24]. Sustainable development based on three basic pillars (social, economic, and environmental) could not be achieved without the proper education of the rural population.

The literacy rate is directly proportional to development; thus, full access of rural communities to educational services should be regarded as starting point to achieve ambitious SDGs in developing countries. Also, rural-urban linkages must be addressed as a pathway to stimulate rural development perspectives. These rural-urban dependences may be positive, negative, or neutral. The positive ones are visible especially in developed countries, the negative ones especially in the less developed countries, but neutral relations are difficult to manage particularly in the proximity of urban areas. Regional convergence aims to reduce the geographical inequalities in the distribution of wealth between large cities, towns, and rural municipalities which are part of an administrative region or county. Such approach could strength the urban-rural relations in common projects regarding infrastructure, public services, mobility, business opportunities (e.g., start-up firms, employment growth) and tourism activities involving local stakeholders in community decisions.

5. Conclusions

This chapter draws attention to the societal and environmental threats which rural communities around the world are facing. Agenda 2030 and SDGs aim to eradicate extreme poverty, famine, open defecation, and other critical issues in developing countries associated with lack of public utilities, mainly in rural areas, and to reduce the huge gaps between countries and regions. To achieve all range of SGDs across the globe, proper attention must be paid to rural development perspectives such as quality of life improvement, sustainable agriculture, rural resilience,

and circular economy and reduced inequalities. Sustainable rural development involves a holistic approach where daily basic needs of rural populations must be covered by reliable public utilities combined with technical, socioeconomic, and environmental conditions to support regional economies and urban-rural linkages. Rural communities must develop several nonfarming activities coupled with agricultural systems (adapted to local geographical conditions) to become more resilient to economic shocks or environmental disturbances in the context of climate change. Rural areas should receive the same attention and opportunities from decision-makers, academics, and professionals regarding sustainable development policies and investments in infrastructure projects. Agenda 2030 could be achieved if sustainable rural development policies will be implemented in each country next to urban areas.

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